

What is claimed is:

1. A display device for displaying an image in response to a video signal on a display screen having a plurality of display cells carrying pixels, said display device comprising:

    a dither coefficient generation component for generating a dither coefficient for each pixel group consisting of a plurality of said pixels corresponding to a location of each pixel in said pixel group;

    a dither adder for adding said dither coefficient to pixel data associated with each of said pixels in accordance with said video signal to obtain dither added pixel data;

    an average error computing component for determining, as an average error value, a difference between an average value of brightness levels represented by said pixel data associated with each of said pixels in said pixel group and an average value of brightness levels represented by said dither added pixel data associated with each of said pixels in said pixel group;

    a correction component for obtaining, as dithered pixel data, a result provided by adding a correction value for reducing said average error value to said dither added pixel data; and

    a display drive component for addressing said display in accordance with said dithered pixel data.

2. The display device according to claim 1, wherein said

correction component comprises:

a correction pixel data count acquiring component for determining, as a correction pixel data count, a count of said dither added pixel data to be corrected in said pixel group in accordance with said average error value;

a subtractor component for determining, as an error value, a difference between a brightness level represented by said pixel data and a brightness level represented by said dither added pixel data; and

a correction pixel data location detector for selecting dither added pixel data to be corrected from each of said dither added pixel data associated with each of said pixels in said pixel group in accordance with said correction pixel data count and said error value.

3. The display device according to claim 2, wherein

as said dither added pixel data to be corrected, said correction pixel data location detector selects dither added pixel data having an absolute value of said error value larger by said correction pixel data count from said dither added pixel data associated with each of said pixels in said pixel group.

4. The display device according to claim 1, wherein

said average error computing component determines an average value of said error value of each pixel group as said average error value.

5. The display device according to claim 2, wherein

said average error computing component determines an

average value of said error value of each pixel group as said average error value.

6. The display device according to claim 1, wherein

in each one field display period of said video signal, said dither coefficient generation component changes a value of said dither coefficient to be generated in response to a location of each pixel in said pixel group.

7. A gray scale processing system for increasing a number of gray scale levels of image brightness expressed by a video signal, comprising:

a frequency detector for detecting a frequency of said video signal;

a gray scale processing circuit for performing gray scale processing on said video signal; and

a gray scale process control component for controlling an operation of said gray scale processing circuit in response to said frequency.

8. The gray scale processing system according to claim 7, wherein

said gray scale processing circuit comprises an error diffusion circuit and/or a dithering circuit.

9. The gray scale processing system according to claim 7, wherein

said gray scale process control component controls said gray scale processing circuit so as to perform said gray scale processing on said video signal when said frequency is lower than a predetermined frequency, while

controlling said gray scale processing circuit so as to deliver said video signal as it is when said frequency is higher than said predetermined frequency.

10. The gray scale processing system according to claim 7, wherein said dithering circuit comprises:

- a first dither coefficient generation circuit for generating a first dither coefficient;

- a second dither coefficient generation circuit for generating a second dither coefficient different from said first dither coefficient; and

- a dither adder for delivering a dithered video signal obtained by adding said first dither coefficient to said video signal when said frequency is lower than a predetermined frequency, while delivering a dithered video signal obtained by adding said second dither coefficient to said video signal when said frequency is higher than said predetermined frequency.

11. The gray scale processing system according to claim 8, wherein said dithering circuit comprises:

- a first dither coefficient generation circuit for generating a first dither coefficient;

- a second dither coefficient generation circuit for generating a second dither coefficient different from said first dither coefficient; and

- a dither adder for delivering a dithered video signal obtained by adding said first dither coefficient to said video signal when said frequency is lower than a

predetermined frequency, while delivering a dithered video signal obtained by adding said second dither coefficient to said video signal when said frequency is higher than said predetermined frequency.

12. A gray scale processing system for increasing a number of gray scale levels of image brightness expressed by a video signal, comprising:

- a frequency detector for detecting a frequency of said video signal,

- a noise adding circuit for obtaining a noise added video signal by adding a noise signal to said video signal,

- a gray scale processing circuit for performing gray scale processing on said video signal, and

- a control component for controlling an operation of each of said gray scale processing circuit and said noise adding circuit in response to said frequency.

13. The gray scale processing system according to claim 12, wherein

- said gray scale processing circuit comprises an error diffusion circuit and/or a dithering circuit.

14. The gray scale processing system according to claim 12, wherein

- said control component controls said gray scale processing circuit so as to perform said gray scale processing on said video signal when said frequency is lower than a predetermined frequency, while controlling said gray scale processing circuit so as to deliver said

video signal as it is when said frequency is higher than said predetermined frequency.

15. The gray scale processing system according to claim 12, wherein

said control component controls said noise adding circuit so as to add said noise signal to said video signal when said frequency is lower than a predetermined frequency, while controlling said noise adding circuit so as to deliver said video signal as it is when said frequency is higher than said predetermined frequency.

16. The gray scale processing system according to claim 10, wherein said dithering circuit comprises:

a first dither coefficient generation circuit for generating a first dither coefficient;

a second dither coefficient generation circuit for generating a second dither coefficient different from said first dither coefficient; and

a dither adder for delivering a dithered video signal obtained by adding said first dither coefficient to said video signal when said frequency is lower than a predetermined frequency, while delivering a dithered video signal obtained by adding said second dither coefficient to said video signal when said frequency is higher than said predetermined frequency.

17. The gray scale processing system according to claim 11, wherein said dithering circuit comprises:

a first dither coefficient generation circuit for

generating a first dither coefficient;

a second dither coefficient generation circuit for generating a second dither coefficient different from said first dither coefficient; and

a dither adder for delivering a dithered video signal obtained by adding said first dither coefficient to said video signal when said frequency is lower than a predetermined frequency, while delivering a dithered video signal obtained by adding said second dither coefficient to said video signal when said frequency is higher than said predetermined frequency.

18. The gray scale processing system according to claim 12, wherein said dithering circuit comprises:

a first dither coefficient generation circuit for generating a first dither coefficient;

a second dither coefficient generation circuit for generating a second dither coefficient different from said first dither coefficient; and

a dither adder for delivering a dithered video signal obtained by adding said first dither coefficient to said video signal when said frequency is lower than a predetermined frequency, while delivering a dithered video signal obtained by adding said second dither coefficient to said video signal when said frequency is higher than said predetermined frequency.

19. A display device with a gray scale processing system for increasing the number of gray scale levels of image

brightness expressed by a video signal, comprising:

- a frequency detector for detecting a frequency of said video signal;

- a gray scale processing circuit for performing gray scale processing on said video signal to generate a gray scaled video signal,

- a display component for displaying an image in response to said gray scaled video signal; and

- a gray scale process control component for controlling an operation of said gray scale processing circuit in response to said frequency.

20. The display device according to claim 19, wherein

- said gray scale processing circuit comprises an error diffusion circuit and/or a dithering circuit.

21. The display device according to claim 19, wherein

- said gray scale process control component controls said gray scale processing circuit so as to perform said gray scale processing on said video signal when said frequency is lower than a predetermined frequency, while controlling said gray scale processing circuit so as to deliver said video signal as it is when said frequency is higher than said predetermined frequency.